



2019 Diversion and Disposal Report

A summary of solid waste management in the State of Vermont

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Waste Management & Prevention Division
Solid Waste Management Program

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Introduction

The Waste Management and Prevention Division's Solid Waste Management Program respectfully submits the Program's annual report describing how solid waste was managed in Vermont during the 2019 calendar year. This narrative report summarizes the sources of data used to determine the annual totals and briefly describes the significant changes and trends.

In the last decade, a few events have significantly changed Vermont's material management. The first of these was the Universal Recycling law of 2012, which focuses on increasing the convenience and choices available and the requirements for the proper management of recyclables and organics. The second was the 2014 adoption of the first statewide Material Management Plan (MMP) which establishes performance measures for the Agency and partners. The second MMP was adopted in 2019. Some of the changes implemented by these efforts include landfill bans on recyclables in July 2015 and leaf and yard debris and clean wood in July 2016, mandatory collection of organics at solid waste facilities in 2017, a full state-wide ban on food scraps in 2020, and regulations on the use of single-use plastic bags, straws and stirrers, and the sale and use of expanded polystyrene food and beverage containers in 2020. The solid waste management systems have adjusted accordingly, and this is reflected by recent changes to the tonnages and types of solid waste managed within Vermont.

The data and information presented within this summary are primarily based on reports that permitted solid waste facilities across the State are required to submit annually. All permitted solid waste facilities (including landfills, transfer stations, material recovery facilities and organics management facilities) are required to provide the Program with detailed information on the flow of solid waste under their management. As such, the data presented in this report is only as reliable as the data submitted. Though there is some quality control maintained over the submitted data, it remains likely that there are inaccuracies in the reporting. On a statewide basis, it is believed that these inaccuracies only have a minor influence on the data compilation. It is also necessary to utilize estimates, derived from existing comprehensive waste composition studies to complete our assessment of comprehensive solid waste management. When an estimate from another source is used within the report it is notated and cited.

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- 2013, DSM Environmental Services, Inc., Tellus Institute and RLS. System Analysis of the Impact of Act 148 on Solid Waste Management in Vermont: Final Report. Prepared for Vermont Department of Environmental Conservation, Solid Waste Management Program.
- 2002, DSM Environmental Services, Inc. Vermont's Municipal Solid Waste Diversion Rate: 2001; Results of Recycling and Reuse Survey. Final Report. Prepared for Vermont Department of Environmental Conservation, Solid Waste Management Program.

Executive Summary

In 2019, Vermonters generated 670,348 tons of municipal solid waste (MSW). This is an increase of 1.4% over the 661,385 tons generated in 2018. Of the solid waste generated, the Vermont materials management system diverted 225,122 tons of material and disposed of 445,226 tons, a 2% increase over the tons disposed in 2018. The resultant 34% diversion rate is comparable to the 33% average diversion rate of the last 10 years. State-wide goals are to reduce the disposal of municipal solid waste to 1,000 lbs./person/year and to increase diversion rates to 50% by 2024 (approximately four years after the comprehensive food scrap landfill ban goes into effect per the Universal Recycling Law). In 2019, Vermonters disposed an average of 1,427 lbs per person.

Approach: Tracking the Flow of Vermont's Solid Waste

Within Vermont, public and private solid waste facilities are required to submit annual or quarterly reports to the Solid Waste Management Program ('Program') on the types, amounts, and management of solid waste materials handled by their facility. Facilities include, but are not limited to, transfer stations, material recovery facilities, compost facilities, landfills, and recycling centers. In some cases, estimates from previous detailed analysis of the Vermont's material management system are also used. These alternative data sources are noted throughout the report when they are used. It is likely that this approach to tracking the flow of solid waste throughout the state underrepresents the total amount of solid waste managed within the state. This is particularly true for non-residential waste. Often significant quantities of commercial and industrial waste do not pass through a permitted Vermont facility, as they may be backhauled or directly transferred to a market. The Program contracted with DSM Environmental Services, Inc. in 2018 to update the estimates used to represent this 'Direct to Broker' or 'economic recycling' of materials.

The Program believes the data for the final management of the State's discarded materials are the most reliable of all the data. With only two landfills operating within the state and a limited number of transfer stations and material recovery facilities that sell directly to markets or reuse materials, the end-use management data aggregated by these types of facilities has the highest likelihood of being consistently and reliably tracked and reproduced from year to year. The ability to document the source and generation of solid waste is a much more challenging task. With a wider variety of types of facilities and collection points within Vermont, generation data is often incomplete and inaccurate. The Program recognizes that this is an area that can be improved; however, it is unlikely that generation data will be as reliable as the disposal and diversion data within the near future. For this reason, the generation value in this report is calculated based on the summation of the tonnages reported from the final management activities that occur at the statewide scale. In its most simplistic format:

$$\text{Disposal (tons) + Diversion (tons) = Generation (tons)}$$

I. Disposal Activities

Disposal at Vermont Facilities — In 2019 there were two permitted and operating solid waste landfills within Vermont (Table 1), however the Salisbury Landfill closed on September 1, 2019, and only accepted 120.4 tons in 2019. Together these landfills accepted 80% of the disposed municipal solid waste generated within Vermont (Table 2). The remaining 20% of Vermont’s disposed municipal solid waste was transported, either directly from the source or from a facility, to an out-of-state (OOS) facility (Figure 1, Table 3).

Table 1. Status of Vermont landfills that were permitted for waste acceptance in 2019

Solid Waste Landfills	Location	Status	Permitted Fill Rate (tons/year)
New England Waste Services, Vermont (NEWSVT): Phase IV: Cells 1-4	Coventry	Operating	600,000
Salisbury Landfill	Salisbury	Closed (9-1-20), unlined	1,000
Northwest Solid Waste District – Sheldon: Cell 1	Sheldon	Permitted, no current plans for construction, not operating	20,000

Table 2. In-state and Out-of-State (OOS) materials disposed *within* Vermont landfills, as reported in 2019

	Total Tons (as reported by disposal facilities)	OOS Tons	VT Tons (Total tons minus OOS tons)
MSW	394,168	---	394,168
C&D	9,132	8,203	930
Sludge (WWTP)	42,440	27,754	14,686
Asbestos	36,712	32,917	3,795
Ash	4,537	4,533	4
Contaminated Soil	8,905	6,977	1,928
Sewer Grit	893	---	893
Paper Sludge	2,995	---	2,995
Medical Waste	110	---	110
Other	37,665	28,512	9,153
TOTAL	537,557	108,896	428,661

Disposal Occurring Out-of-State — Information about Vermont waste that is disposed out-of-state (OOS) is derived from two sources. Facilities report the quantity of materials that they have sent OOS for final management; however, this does not capture materials that are hauled directly OOS without passing through a reporting Vermont facility. For this reason, an annual independent audit collects data from OOS facilities and from haulers that are known to manage Vermont solid waste. The auditor reports these values annually to the Program and this information is combined with the Vermont facility reports to derive the OOS transport tonnage.

Table 3. Solid waste sourced in Vermont but sent for management at an Out-of-State facility in 2019

	Massachusetts	New Hampshire	New York	Quebec	Total
MSW	38	40,383	66,228	---	106,649
C&D	---	15,136	18,966	---	34,102

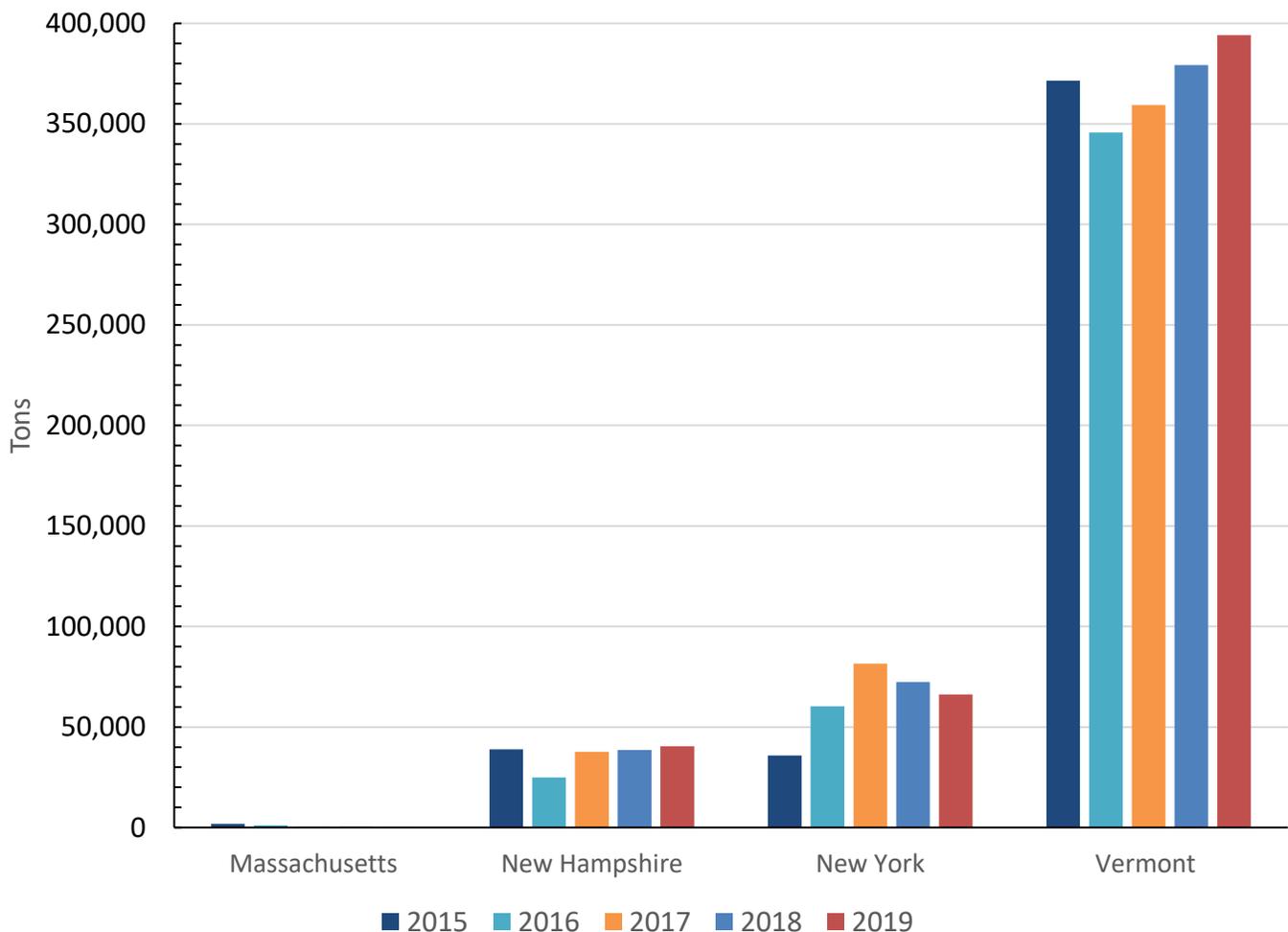


Figure 1: Destination of disposed MSW that was generated in Vermont in 2019, with recent years for comparison.

Beneficial Use in Vermont Landfills — In addition to the disposal of materials within Vermont’s landfills, there are several material types that can be used for landfill operations (Table 4). These materials are used in place of virgin materials for daily cover and operations, and although their ultimate end use is within the airspace of the landfill, they are classified as beneficial use. Materials that are used beneficially in the landfill are not included in MSW disposal or diversion tonnages.

Table 4. Beneficial use of solid waste materials within Vermont landfill operations in 2019

Material	Use	Tonnage
Paper Sludge	Landfill Alternative Daily Cover	282
Contaminated Soils	Landfill Alternative Daily Cover	30,335
Sludge – cut with soil	Landfill Alternative Daily Cover	2,104
Sand Blast Grit	Landfill Alternative Daily Cover	77
Asphalt, Brick, Concrete	Landfill Road Base	0
Processed C&D	Landfill Road Base	3,228
Sawdust	Landfill Road Base	866
Mixed, Crushed Glass	Landfill Road Base	0
Total		36,892

Adjusting MSW for Construction & Demolition Debris — Some Construction and Demolition (C&D) materials are tracked separately from MSW, and are reported as being sent for disposal, beneficial use, or diversion. However, loads of disposal materials are often co-mingled at transfer facilities and reported solely as MSW, though the load may contain C&D. It is often difficult to separate these materials from the municipal solid waste (MSW) stream given the current materials management systems in the state.

For this reason, the results of the 2019 waste characterization study prepared for the State of Vermont by DSM Environmental are used to estimate the C&D and MSW percentages of all materials reported as disposed (Table 5). Manual and visual separation of MSW materials during the waste composition study indicated that 11.1% of MSW consisted of C&D waste (2018, DSM Environmental, et al.).

Table 5. Adjustment of MSW tonnage for estimated C&D component

	Reported Tonnages	C&D tonnage (11.1% of reported MSW)	Remaining MSW Tonnage
Vermont MSW In-state Disposal	394,168	43,753	350,415
Vermont MSW Out-of-State Disposal	106,649	11,838	94811
Total Vermont MSW Disposal			445,226

II. Diversion Activities

Materials are diverted from the landfill through a variety of pathways in Vermont. While the Solid Waste Management Program has reliable reporting systems in place for some components of these diversion pathways, others are not directly reported and require approximation. Broadly, there are four principal avenues of material diversion which are accounted for by this report (Table 6):

Group A – From a Reporting Facility to a Market

As with the disposal data, most of the state's diversion data comes from facilities that self-report the flow of diverted materials. Within Vermont there are two large material recovery facilities (MRF's) that manage the majority of diverted recyclable materials. These facilities collect, sort, and process materials for distribution to recycling markets. As permitted solid waste facilities, they report quarterly to the Solid Waste Program. Additionally, some materials that are collected by transfer stations and recycling centers do not require further separation and can be sold directly by the collection facility to market. One hundred ten collection facilities reported selling some type of material directly to a market.

In 2019, there were eleven compost facilities within the State that were certified to process food scraps and/or leaf and yard debris.

Construction and demolition (C&D) materials are also tracked in Group A. Historically, C&D materials have been excluded from the materials tracked in the diversion tonnages. These materials are difficult to track due to the significant reuse of materials occurring outside of the Solid Waste system. However, in late 2013, the State's first dedicated C&D recycling facility opened, and several other solid waste facilities have since adopted more active separation programs to collect and market the valuable C&D materials. In July of 2014, the Vermont Legislature passed Act 175 which mandated the recycling of architectural waste, a subset of construction and demolition waste (i.e. scrap metal, asphalt shingles, clean wood, drywall, plywood, and oriented strand-board) for commercial and multi-unit residential building projects that produce over 40 cubic yards of architectural waste and are within 20 miles of a C&D recycling facility. Recycling markets for C&D materials have fluctuated significantly since 2014 and architectural waste facilities have adjusted to these fluctuations by altering the types and volumes of materials that they are capable of managing. In addition to variability in the amount of C&D generated, which is impacted by economy and local development patterns, changes in the reported tonnages by these architectural waste facilities reflect both changes to the market and changes in the operations, which can vary substantially year to year. Further, the difficulty of distinguishing C&D from other waste types in mixed loads may cause misreporting.

Group B – Estimate of Direct to Broker or Market (Economic Recycling)

In some cases, the recovery of materials occurs directly between business entities and brokers, thereby bypassing a reporting Vermont solid waste facility. For example, a supermarket may sell and ship large quantities of cardboard directly to a broker, instead of hiring a hauler, because it makes economic sense for a business of this scale to sell its recyclables directly. In the 2018 Vermont Waste Characterization Study (2018, DSM Environmental et al.), a survey of Vermont employers and manufacturing facilities identified and estimated the amount of recyclable materials that were either backhauled or sold directly to a broker by the business sector. On the basis of an extrapolated survey, this study estimated the tonnage of fibers, containers, and scrap metal delivered directly to a broker or market in 2018. Because economic recycling has been shown to be a significant contributor to the diversion of materials, estimates have been included in the annual Vermont Diversion and Disposal Report since the completion of the first estimate of economic recycling in a 2001 study (2001, DSM Environmental). This is the second Diversion and Disposal Report to use the updated economic recycling numbers from the 2018 study. The other category of material types sent directly to a broker without passing through a Vermont solid waste facility is the estimated 17,480 tons of beverage containers collected and processed through the Vermont Bottle Bill

for distribution to market (Table 40; 2013, DSM Environmental). As Vermont redemption centers are not considered solid waste facilities, they are not required to report annual tonnages on this important diversion activity.

Group C – Reported Reuse Activities

There are numerous reuse, resale, and repair businesses throughout Vermont; however, the diversity of material reused across the State makes estimates of this activity difficult, highly variable, and inaccurate. For that reason, this report is limited to listing reuse totals derived from facility reporting. In other words, only materials collected at permitted solid waste facilities for the purpose of local reuse are captured. As an example, the reuse listed here includes intact building materials, like cabinets, and used clothing. Reported reuse does not capture the vast amount of materials that are taken from the point of generation (residences, businesses, etc.) directly to a reuse or salvage store, or re-purposed at the point of generation.

Group D – Estimated Household Composting

Significant diversion of food waste and leaf and yard waste occurs at home without material being handled by a solid waste facility. Home composting of both food waste and leaf and yard waste is anticipated to significantly contribute to the state's long-term diversion goals. In 2018, DSM Environmental et al. characterized the amount of food waste diverted annually by each Vermont household through an analysis of a representative, statewide survey. They estimated that 58% of Vermont households compost an average of 367 pounds of food waste annually. A similar 2001 study evaluated Chittenden County household leaf and yard waste diversion through home composting (2002, DSM Environmental). This survey estimated that 250 pounds of yard waste was composted by 39% of the surveyed households. These estimates, derived from these survey results, are the current best estimates available for calculating a rough value of the tonnage diverted by home composting. With the advent of Universal Recycling within the State, home composting is likely to continue increasing as a diversion tool and these estimates will have to be revised as studies and data are available.

Table 6. Summary of Vermont's 2019 diversion activities

(in tons)	Fibers	Containers	Single Stream	C&D	Scrap Metal	Organics	Foodbank Food Rescue	Miscellaneous
A- From Reporting Facility to Market	66,631	16,518	1,810	6,053	15,730	15,145		67
B- Estimate of Direct to Broker or Market (Economic Recycling)	20,707 [†]	17,480* 2,686 [†]			1,616 [†]	2,552 [†]		1,159 [†]
C- Reported Reuse Activities	541	5		8			3,658	89
D – Estimated Household Composting						16,548 [§] 36127 [†]		
TOTALS	87,879	36,689	1,810	6,053	17,346	70,372	3,658	1,315
	A + B + C + D = 225,122							

* Denotes an estimate derived from the System Analysis of the Impact of Act 148 on Solid Waste management in Vermont (2013, DSM Environmental Services, Inc.)

[†] Denotes a food waste diversion estimate derived from the 2018 Vermont Waste Characterization Report (2018, DSM Environmental). See above descriptions of the diversion groups for details.

[†] Denotes values determined from tonnages provided by the Vermont Foodbank.

[§] Denotes a leaf and yard waste diversion estimate derived from the Vermont's Municipal Solid Waste Diversion Rate 2001 study (2002, DSM Environmental). See above descriptions of the diversion groups for details.

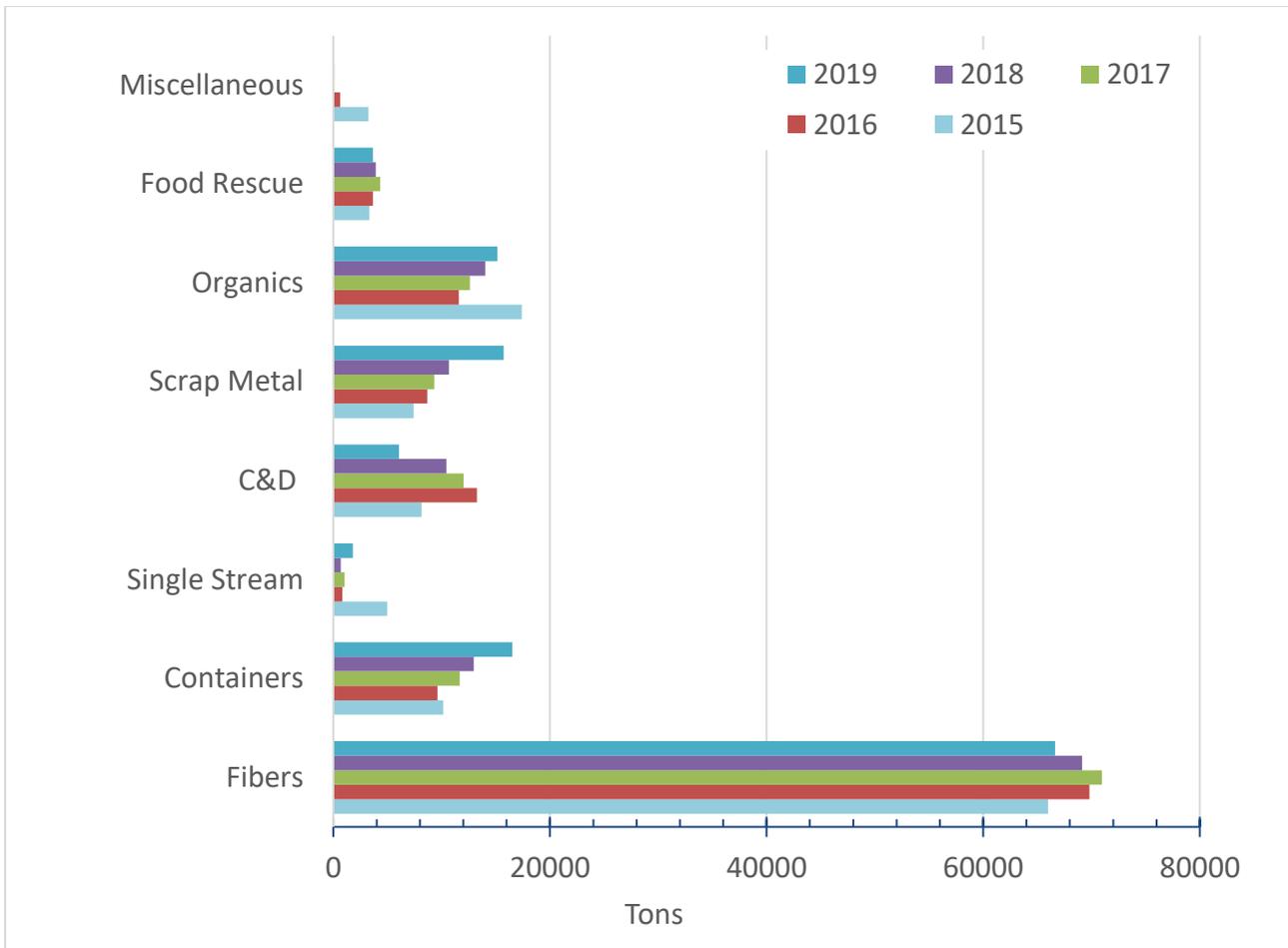


Figure 2: 2014-2019 comparison of materials marketed directly from Vermont solid waste facilities (Group A from Table 6 and Food Rescue).

Figure 2 displays the composition of diverted materials sold or donated to market year-to-year. Comparing diversion tonnages by material type helps the Program consider the impacts of market conditions on recycling/composting/donation activity in Vermont. Overall, the total tonnage of diverted material decreased from 2018 to 2019. It is also important to remember that the total tonnage of diverted materials changes each year as generation fluctuates. When considering the progress of recycling efforts in Vermont, the percent of materials diverted is a better metric than the total tonnage.

III. Total Municipal Solid Waste Generation and Summary

On the basis of the previously stated formula:

$$\text{Disposal} + \text{Diversion} = \text{Generation}$$

Vermont generated **670,348 tons** of municipal solid waste materials in 2019. Total MSW disposal (adjusted to remove C&D component) was 445,226 tons, a sizable increase from 2018, while diversion decreased to 225,122 tons.

While this figure is an under-representation of the complete material management tonnages for the state, it does represent the components that the Solid Waste Program can accurately and consistently track year to year for meaningful comparisons.

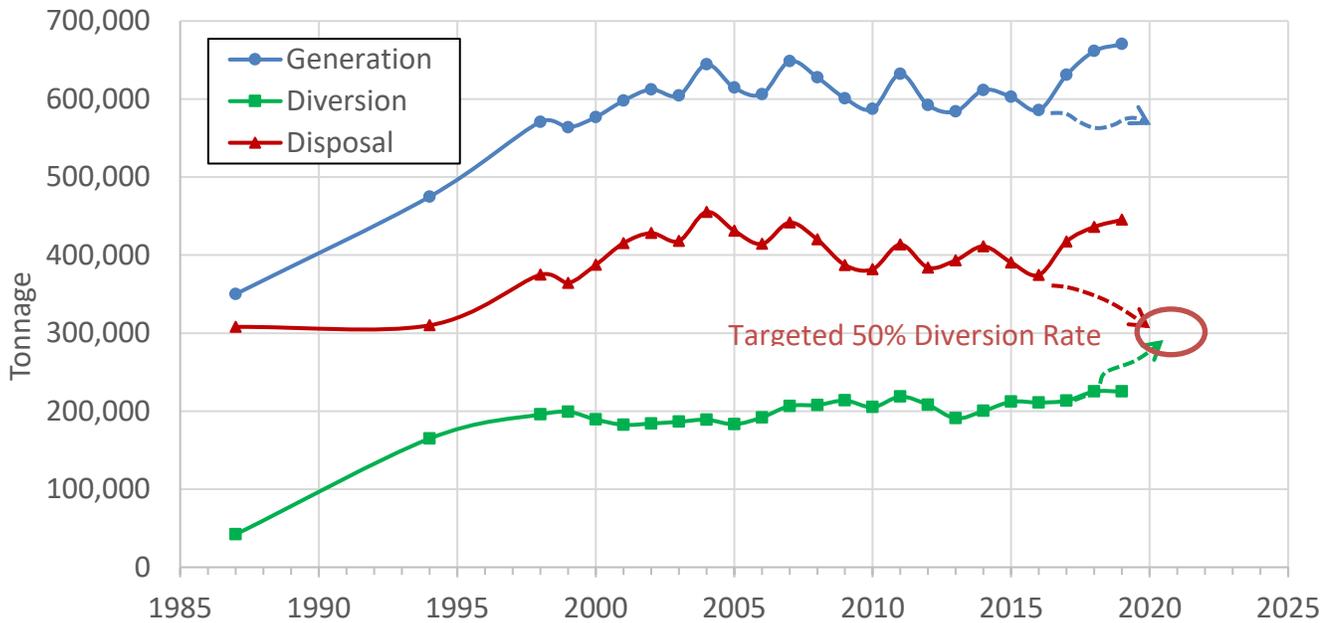


Figure 3: Projections of waste generation, diversion, and disposal with the implementation of Universal Recycling over the coming years.

Table 7. Vermont generation, diversion and disposal totals for municipal solid waste. Includes tonnages, per capita breakdowns and percentage rates.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Generation	609,497	579,689	571,446	613,517	592,981	566,042	552,297	597,254	557,302	584,235	611,472	602,617	585,789	630,851	661,385 *673,403	670,348
Diversion	154,217	148,459	157,173	171,818	173,024	178,796	170,326	183,737	173,258	190,797	200,272	212,065	211,152	213,449	225,219 *237,237	225,122
Disposal	455,281	431,230	414,273	441,699	419,957	387,246	381,971	413,517	384,044	393,438	411,200	390,552	374,637	417,402	436,166	445,226
Population [1]	618,794	619,736	620,778	621,254	621,270	621,750	625,741	626,592	625,953	626,630	626,562	626,042	624,594	623,657	626,299	623,989
Per Capita MSW Generation (Tons/Year)	0.98	0.94	0.92	0.99	0.95	0.91	0.88	0.95	0.89	0.93	1.0	0.96	0.94	1.01	1.08	1.08
(Pounds/Day)	5.40	5.13	5.04	5.41	5.23	4.99	4.84	5.22	4.88	5.11	5.35	5.27	5.14	5.54	5.89	5.88
Per Capita MSW Diversion (Tons/Year)	0.25	0.24	0.25	0.28	0.28	0.29	0.27	0.29	0.28	0.30	0.32	0.34	0.34	0.34	0.38	0.36
(Pounds/Day)	1.37	1.31	1.39	1.52	1.53	1.58	1.49	1.61	1.52	1.67	1.75	1.86	1.85	1.88	2.08	1.97
Per Capita MSW Disposal (Tons/Year)	0.74	0.70	0.67	0.71	0.68	0.62	0.61	0.66	0.61	0.63	0.66	0.62	0.60	0.67	0.70	0.71
(Pounds/Day)	4.03	3.81	3.66	3.90	3.70	3.41	3.34	3.62	3.36	3.44	3.60	3.41	3.29	3.67	3.82	3.91
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Generation	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Diversion	25%	26%	28%	28%	29%	32%	31%	31%	31%	33%	33%	35%	36%	34%	34%	34%
Disposal	75%	74%	72%	72%	71%	68%	69%	69%	69%	67%	67%	65%	64%	66%	66%	66%

[1] Population Estimate, Vermont. US Census: <http://census.gov>

* There was an error in the 2018 diversion data. The corrected value is above.

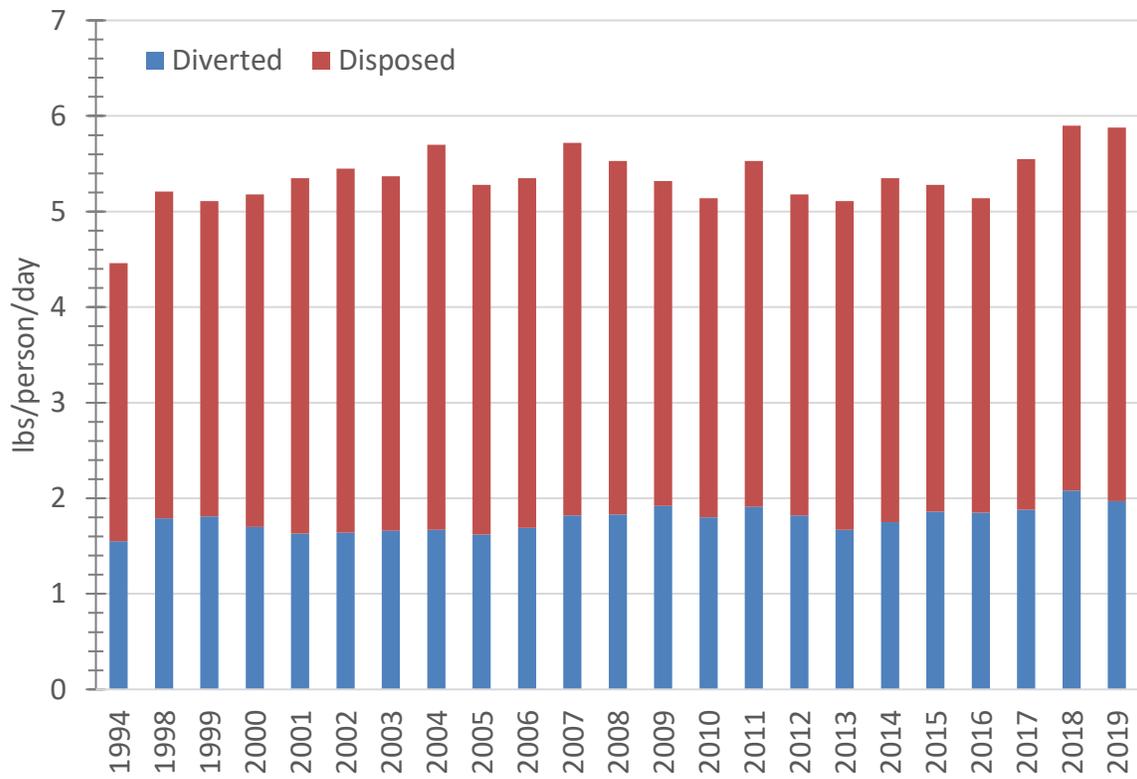


Figure 4: Pounds of waste generated per day per person (disposed + diverted) by Vermonters

IV. Other Material Management Activities – Not included in disposal or diversion tonnages

Hazardous Waste

Household hazardous waste (HHW) and conditionally exempt generator (CEG) hazardous waste is collected and managed at several fixed full-time facilities in the state and at numerous collection events, 126 in 2019, hosted by municipalities throughout the year. Information on the materials collected over the course of the year is reported through the ReTRAC™ online reporting system similar to the solid waste facility reporting, as described earlier. This data is summarized in an annual HHW Survey Results report (Appendix A). A total of 935 tons of combined HHW and CEG materials were collected in 2019, an increase over the 906 tons collected in 2018 (Table 8). It is important to note that the values reported within the HHW Survey Results only reflect material collected at fixed HHW facilities and events. These numbers do not capture all the HHW that is collected through extended producer responsibility programs as reported upon below.

Table 8. Summary of historic hazardous waste collections and participation

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Total HHW and CEG tons	935	906	865	1,069	899	452	525	460	467	489	566	436
% participating VT households	11%	9%	10%	8%	6%	7%	7%	9%	7%	6%	8%	9%
Pounds collected per household (avg.)	55	60	60	86	131	102	62	34	47	46	45	30

Mercury Programs

In 2007, Act 149 banned the knowing disposal of products containing mercury within Vermont landfills. Extended Producer Responsibility (EPR) programs for collection and recycling of mercury were established for thermostats in 2008 and for some mercury-containing lamps in 2012.

Mercury-containing thermostats are collected and reported on by the Thermostat Recycling Corporation to the State of Vermont. This program collected 16.89 pounds of mercury in 2019 from 2,069 thermostats.

Mercury-containing lamps that are covered by the EPR program are collected, recycled, and reported on by the National Electrical Manufacturers Association (NEMA). During 2019, NEMA collected and recycled 1.84 pounds of mercury from 186,652 mercury-containing lamps and bulbs (the 2018 total was incorrectly reported as 6.3 lbs; the correct total was 2.1 lbs). Mercury-containing lamps that are not covered by the EPR program and lamps that are covered by the program and collected by municipalities are categorized as household hazardous waste in this report.

Vermont Electronic Recycling Program

The Vermont Electronic Recycling Program (E-cycles) was first implemented in July of 2011. This program provides no-cost electronic device recycling for covered entities and devices. During the 2019 collection period, 1,730 tons of e-waste were collected.

Batteries

In 2014, Vermont became the first state to require manufacturers to fund recycling of single-use batteries, with the passage of the Vermont Primary Battery Stewardship Law. The law requires producers of primary batteries (non-rechargeable batteries) sold in Vermont to register with Vermont Department of Environmental Conservation (DEC) and provide a stewardship plan to manage the proper recycling and/or disposal of primary batteries sold in Vermont. A Primary Battery is a non-rechargeable battery weighing two kilograms or less, including alkaline, carbon-zinc, and lithium metal batteries. Producers may choose to submit an individual stewardship plan or participate in a shared stewardship plan. Currently, most producers who sell in Vermont are under a shared stewardship plan which is implemented by the stewardship organization Call2Recycle.

Call2Recycle implements both the primary (non-rechargeable) battery stewardship program mandated by Vermont law and the manufacturer-led voluntary rechargeable battery collection program. This allows for both types of batteries to be collected at no cost to consumers in Vermont in convenient locations throughout the state. There are over 100 collection sites available in Vermont for battery recycling which offers 98% of Vermont residents and businesses access to a collection site within 10 miles of their home or business. The stewardship program is funded by battery producers who pay fees based upon their Vermont sales.

During the 2019 collection year, Call2Recycle collected 166,877 pounds of batteries (113,451 lbs primary and 53,426 lbs rechargeable), 14% more than Call2Recycle collected in 2018.

PaintCare

In May of 2013, the Vermont Legislature passed paint product stewardship legislation (Act 58) that establishes free paint collection sites at retailers and permitted solid waste facilities across the State, funded by a small fee appended to paint sales in Vermont. This program is implemented by a stewardship organization called PaintCare, who worked with the Solid Waste Program in 2013 to develop the final Vermont Paint Stewardship Program Plan. The program officially launched on May 1, 2014. An annual report is due to the Program by October of each year, with a reporting period of July 1-June 30th. During this fourth collection period, July 1, 2018 to June 30, 2019, 115,142 gallons were collected. This is a 4% increase from the previous year and a significant increase over the average annual collection of 60,000 gallons that occurred in years prior to implementation of the PaintCare program. 75% of the paint collected that year was latex paint, and 21% of the latex paint was unusable and sent to landfill. The rest of the paint collected was recycled, reused, or used as fuel.

Appendix A: Household Hazardous Waste Report

SUMMARY OF 2019 VERMONT HHW/CEG WASTE PROGRAMS

All Solid Waste Districts and Alliances, in alphabetical order

HHW/CEG Material Collected (all materials in tons) [†]	All Solid Waste Districts and Alliances, in alphabetical order														
	Addison SWMD	Bennington County Solid Waste Alliance	Central Vermont SWMD	Chittenden SWD	Lamoille RSWMD	Londonderry Group	Mad River RMA	Mountain Alliance	Northeast Kingdom WMD	Northwest SWMD	Rutland County SWD (excludes SWAC)	Solid Waste Alliance	Southern W/V Counties	Windham SWD	White River Alliance
1 Acids	0.57	0.27	0.70	2.73	0.44	0.15	0.18	0.34	0.20	0.60	0.09	0.10	0.44	0.09	0.48
2 Aerosols	2.11	0.74	2.17	12.81	1.23	0.25	0.74	0.59	0.27	1.28	6.91	0.73	1.52	0.47	1.10
3 Bases	1.03	0.63	1.11	3.55	0.47	0.10	0.13	0.03	0.20	0.38	-	-	0.44	-	0.90
4 Fire Extinguishers	-	0.06	-	0.10	0.05	-	-	-	0.15	0.28	-	0.04	-	-	-
5 Flammables & Solvents	18.28	3.77	7.88	39.84	5.98	1.40	8.24	1.53	12.10	1.80	2.81	0.88	2.42	3.13	3.08
6 Glycols (Antifreeze)	2.60	-	-	11.69	0.21	-	-	-	1.32	0.87	5.59	0.25	-	0.44	-
7 Oxidizers	0.21	0.11	0.32	1.09	0.17	0.03	0.23	-	0.07	0.04	0.11	0.02	0.08	-	0.22
8 Lead Paint Chips & Debris	0.11	-	0.12	0.48	-	0.01	-	-	-	-	-	-	-	-	-
9 Paints – Latex	34.87	-	8.28	#####	-	-	-	-	9.59	16.53	6.13	3.18	-	-	6.54
10 Paints – Oil	13.55	-	2.91	38.73	-	-	-	-	2.95	3.74	6.11	0.73	-	-	2.82
11 Paints – Oil + Latex, Mixed	-	13.24	0.40	-	0.21	-	6.64	-	-	-	44.08	0.34	-	-	0.74
12 Paints – Non-process Resins	8.75	2.58	8.28	24.87	2.58	1.20	-	2.18	6.27	2.58	5.24	1.18	3.88	0.18	-
13 Pesticides	2.20	4.19	4.00	18.55	4.08	0.55	2.43	1.02	1.02	1.32	0.87	1.07	1.84	0.41	0.83
14 Propane Tanks	2.42	0.03	-	-	-	-	-	-	2.09	0.15	3.88	0.48	-	-	1.60
15 Reactives	0.10	-	0.03	0.28	0.02	-	-	-	-	-	0.02	0.08	-	0.00	-
16 Toxics	0.92	0.15	0.25	0.43	-	-	-	-	-	0.02	0.13	-	-	0.55	-
17 Photo Chemicals	-	-	0.13	0.25	-	-	-	-	-	0.02	-	-	-	-	-
18 Waste Oil – Uncontaminated	8.44	-	-	17.53	2.08	-	0.83	-	8.58	1.98	5.80	0.19	-	0.40	-
19 Waste Oil – Contaminated	-	-	-	-	-	-	-	-	-	-	-	-	2.08	-	-
20 Waste Oil – Oily Debris	1.78	0.03	0.41	9.06	0.64	0.02	-	-	0.66	0.21	0.22	0.08	-	0.22	-
21 Waste Oil – Oil Filters	2.84	-	-	1.88	0.11	-	-	-	2.26	-	-	-	-	-	-
22 Oily Water	2.89	-	0.85	2.28	2.71	-	-	-	-	0.02	-	-	-	0.31	-
23 Mercury – Fluorescent Tubes	8.68	0.01	0.03	23.17	-	-	0.05	-	2.23	1.25	4.09	0.08	-	-	0.54
24 Mercury – Other Lamps	0.10	0.03	0.05	-	-	-	0.04	-	0.99	0.04	1.30	0.03	-	-	-
25 Mercury – Added Products	0.01	0.02	0.07	0.55	0.01	-	0.02	0.01	-	0.04	0.18	0.02	0.02	0.00	-
26 Mercury – Elemental	-	-	-	-	-	-	-	-	-	-	-	0.00	-	-	-
27 Mercury – Compounds	-	-	0.02	-	-	0.00	-	-	-	-	-	-	-	0.00	-
28 Primary Batteries	3.52	-	0.23	18.90	-	-	0.08	-	5.10	5.36	0.40	0.18	-	-	0.93
29 Rechargeable Batteries	11.72	0.04	0.49	3.99	-	-	-	-	1.30	2.58	6.18	-	-	-	-
30 Lead-Acid Batteries	4.93	-	-	-	-	-	0.40	-	-	3.60	-	-	-	-	1.24
31 Other misc. products	0.25	0.99	-	15.08	0.05	0.01	0.64	0.15	1.44	2.66	1.55	0.77	-	2.72	-
Demographics															
Occupied Households in Area ^{††}	13,798	14,549	22,884	61,815	10,906	1,478	5,344	4,792	19,751	19,824	19,963	5,786	13,856	15,381	3,971
Program Profiles															
Number of Events Held	3	2	5	16	4	2	2	4	10	7	33	4	4	4	3
# of households served	3034	448	654	11709	775	184	829	195	3279	1918	3168	250	407	276	119
# of businesses served	103	1	12	665	7	0	21	0	1	51	184	19	2	5	0
% household participation	22%	3%	3%	19%	7%	12%	12%	4%	17%	10%	16%	4%	3%	2%	3%
Total HHW/CEG (tons)	#####	26.89	36.68	#####	21.04	3.71	18.60	5.84	58.80	47.33	101.65	10.11	12.71	8.91	21.00
Total CEG Collected (tons)	9.38	-	2.47	#####	-	-	0.78	-	2.10	0.62	1.10	0.97	0.69	-	-
Total HHW Collected (tons)	#####	26.89	36.21	#####	21.04	3.71	17.82	5.84	56.70	46.71	#####	9.14	12.02	8.91	21.00
Avg. HHW/per household (tons)	0.04	0.06	0.06	0.02	0.03	0.02	0.03	0.03	0.02	0.02	0.03	0.04	0.03	0.03	0.18
Avg. CEG/per business (tons)	0.09	-	0.21	0.21	-	-	0.04	-	2.10	0.01	0.01	0.05	0.35	-	-

SEE VERMONT
TOTALS FOR
EACH MATERIAL
ON PAGE 2

[†] All reported materials are converted to tons using VT Solid Waste Program Combined HHW Conversion Factors. See cover page for details.

^{††} Household estimates were derived from the US Census Bureau: Population, Housing Units, Area and Density: 2010.

SUMMARY OF 2019 VERMONT HHW/CEG WASTE PROGRAMS

All Independent Towns, Shared HHW Events

HHW/CEG Material Collected (all materials in tons) [†]	All Independent Towns, Shared HHW Events							VERMONT TOTALS
	Canaan shared with Lemington	Coventry, shared with Barton, Lowell and Newport City	Fairfax	St. Johnsbury shared with Burke	Greater Upper Valley SWD shared with Hartford	Wilmington	Winnell	
1 Acids	-	-	0.25	0.32	0.18	0.34	0.05	8.5
2 Aerosols	0.21	0.38	0.30	0.49	2.43	0.44	0.27	37.4
3 Bases	-	-	0.04	0.28	0.53	-	0.01	9.8
4 Fire Extinguishers	-	-	-	-	0.04	-	-	0.7
5 Flammables & Solvents	0.42	1.95	3.50	1.62	6.31	0.44	1.04	124.2
6 Glycols (Antifreeze)	-	-	-	0.22	-	-	-	23.2
7 Oxidizers	-	-	-	0.12	0.11	0.34	0.02	3.3
8 Lead Paint Chips & Debris	-	-	-	-	-	-	-	0.7
9 Paints – Latex	-	-	-	-	-	-	-	222.9
10 Paints – Oil	-	-	-	-	-	-	-	71.5
11 Paints – Oil + Latex, Mixed	-	0.75	-	1.05	-	-	-	67.5
12 Paints – Non-process Resins	-	-	-	-	3.32	-	0.77	73.8
13 Pesticides	0.83	0.79	0.70	0.72	4.01	0.44	0.02	49.9
14 Propane Tanks	-	-	-	-	-	-	-	10.6
15 Reactives	-	-	-	-	-	-	-	0.5
16 Toxics	-	-	-	-	1.84	-	-	4.3
17 Photo Chemicals	-	-	-	-	-	-	-	0.4
18 Waste Oil – Uncontaminated	-	-	-	0.44	0.21	-	-	46.5
19 Waste Oil – Contaminated	-	-	-	-	0.22	-	-	2.3
20 Waste Oil – Oily Debris	-	-	-	0.15	0.06	-	0.01	13.5
21 Waste Oil – Oil Filters	-	-	-	-	-	-	-	7.1
22 Oily Water	-	-	-	-	1.46	-	-	10.5
23 Mercury – Fluorescent Tubes	-	0.15	0.22	0.34	-	-	0.02	40.9
24 Mercury – Other Lamps	-	0.00	0.10	-	-	-	0.00	2.7
25 Mercury – Added Products	-	-	0.01	-	0.02	-	0.01	0.9
26 Mercury – Elemental	-	-	-	-	-	-	-	0.0
27 Mercury – Compounds	-	-	-	-	-	-	-	0.0
28 Primary Batteries	-	0.04	0.10	-	-	-	-	34.8
29 Rechargeable Batteries	-	-	0.04	-	-	-	-	26.3
30 Lead-Acid Batteries	-	0.03	0.02	-	-	-	-	10.2
31 Other misc. products	-	0.30	0.26	-	2.77	0.34	0.05	30.0
Demographics								
Occupied Households in Area ^{††}	489	3,818	1,591	3,888	12,211	574	343	256,582
Program Profiles								
Number of Events Held	4	3	3	3	4	3	3	126
# of households served	32	270	265	212	292	25	-	28,139
# of businesses served	-	5	-	15	-	-	-	1,091
% households served	7%	7%	17%	5%	2%	4%	-	11%
Total HHW/CEG (tons)	1.46	4.38	5.51	5.74	23.50	2.34	2.27	935
Total CEG Collected (tons)	-	-	-	0.34	-	-	-	156
Total HHW Collected (tons)	1.46	4.38	5.51	5.40	23.50	2.34	2.27	779
Avg. HHW/per household (tons)	0.05	0.02	0.02	0.03	0.08	0.09	-	0.03
Avg. CEG/per business (tons)	-	-	-	-	-	-	-	0.14
[†] All reported materials are converted to tons using VT Solid Waste Program Combined HHW Conversion Factors. ^{††} Household estimates were derived from the US Census Bureau: Population, Housing Units, Area and Density: 2010.								

Appendix B: Vermont Biosolids Management Statistics for 2019

2019 Vermont Sludge & Biosolids Management Statistics			
Management Option	In-State	Out-of-State	Totals
Volume (Dry Tons)			
Beneficial Reuse*	3,157	3,140	6,297
Landfill Disposal	3,788	1,030	4,818
Total	6,944	4,170	11,114
Percentages			
Beneficial Reuse	28.4	28.3	56.7
Landfill Disposal	34.1	9.3	43.4
Total	62.5	37.5	100.0

*Note: 427 dry tons (3.8%) land applied in VT as Class B Biosolids.

2019 Vermont Septage Management Statistics			
Management Option	In-State	Out-of-State	Totals
Volume (Gallons)			
Land Application	4,822,279	78,806	4,901,085
Wastewater Treatment Facility Disposal	31,567,916	2,923,313	34,491,229
Total	36,390,194	3,002,119	39,392,313
Percentages			
Land Application	12.2	0.2	12.4
Wastewater Treatment Facility Disposal	80.1	7.4	87.6
Total	92.4	7.6	100.0